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NOTES ON PARASITES IN 1932.

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The table which follows contains the names of some of the parasitic and other forms which I have examined during the year. To it have been added a few remarks upon species of any particular interest. The purpose of the notes is to call attention to those species upon which practitioners have desired information.

Name	Host & Habitat	Locality
Protozoa.		
Eimeria tenella ...	Pheasant (fæces)	——
deblieckl ...	Pig (fæces)	Lancs.
Isospora rivolta ...	Dog „	Glos.
Trematoda.		
Fasciola hepatica	Sheep (liver)	Cyprus
Cestoda.		
Tænia marginata	Dog (intestine)	Ches.
pisiformis ...	„ „	„
saginata ...	Man „	Lancs.
granulosa (cyst)	Elephant (liver)	„
Anoplocephala perfoliata	Horse (fæces)	Lancs. & Cornwall
Moniezia (?) *expansa*	Giraffe „	„
Dipylidium caninum	Dog (intestine)	Cyprus
Diplopylidium noller.	Cat „	„
Joyeuxia pasquali	Cat „	„
Mesocestoides lineatus	Fox „	„
perlatus	Ruppert's Peregrine Falcon	Khartoum
**Davainea spiralis*	Pigeon „	Cyprus
Dithyridium elongatum	Fox (body cavities)	„
**Phyllobothria gigantea*	Pollock [redacted]	Cornwall
Nematoda.		
Ascaris lumbricoides	Malayan Bear (intestine)	Suffolk
Toxocara canis ...	Dog „	Lancs.
Toxascaris leonina	Dog „	Cyprus
Angusticæcum holopterum	Tortoise „	Ches.
Anisakis sp. (larvæ)	Pollock (muscles)	Cornwall
Porrocæcum decipiens	Seal (stomach)	Chile
Ascaridia gallinæ	Fowl intestine)	Cyprus
Thelazia rhodesii	Ox (conjunctival sac)	„
Setaria sp.	Horse (eye)	India
Serratospiculum tendo	Ruppert's Peregrine Falcon (muscle)	Khartoum
Onchocerca cervicalis	Horse (withers)	Staffs.
Habronema muscæ	Horse (stomach)	Cyprus
Gongylonema verrucosum	Goat (stomach)	Cyprus
monnigi	Goat „	„
Bunostomum trigoncephalum	Sheep (intestine	„
Strongylus edentatus	Horse (colon)	Chile
vulgaris	„ (aneurysm)	Ches.
Trichonema coronatum	„ (colon)	Chile
Amidostomum nodosum	Goose (gizzard)	——
Trichostrongylus tenuis	Partridge (intestine)	——
Trichuris ovis	Goat (cæcum)	Cyprus
Capillaria sp.	Canary	Glos.
Acanthocephala.		
Filicollis anatis	Duck (intestine)	——
Acarina.		
Argas persicus ...	Fowl (skin)	Cyprus
Hyalomma syriacum	Tortoise „	Lancs.
Notædres minor	Cat „	„
Notædres sp. ...	Hampster „	——
Tarsonemus sp. ...	Dog „	Ches.
Carpoglyphus anonymus	Dates	Lancs.
Tyroglyphus longior	Ox (skin)	Lancs.
Insecta.		
Hypoderma æratum	Goat (skin)	Cyprus
Oestrus ovis ...	Sheep (nostril)	„
Ricinus sp. ...	Redpoll (feathers)	——
†*Lipeurus heterographus*	Turkey (feathers)	Lancs.
†*Esthiopterum latum*	Rhea (feathers)	Chile
Trichodectes scalaris	Ox (skin)	Lancs.
Ctenocephalides felis	Fox (skin)	Cyprus
canis ...	Fox (skin)	„
Lepisma saccharina	Dog (skin)	Ches.

* Kindly determined by Dr. T. Southwell.

† Kindly determined by Mr. G. B. Thompson.

Protozoa.—According to Tyzzer, "*Eimeria avium*" of poultry really represents five species and the present record of *E. tenella* from the pheasant is one of them. *E. deblieckl* is sometimes the cause of clinical coccidiosis in swine.

Cestoda.—The record of *Tænia saginata* from a human being who had not been out of England reminds us that the cyst *must* occur here in cattle and that it may escape destruction in the process of preparation for the table. A fertile echinococcus cyst of *T. granulosa* was found in the liver of an Indian elephant. It was about the size of a cricket ball. The segments of the equine perfoliate tapeworm (*Anoplocephala perfoliata*) often occur in fæces. The usual history is that disc-like creamish-white bodies are seen on the outer

DEPT. OF VET. MEDICINE

XUM

surface of the fæcal masses. Each is about the size of a wheat straw on section. If one is placed in a little pure liquid carbolic acid, allowed to clear and then examined in that fluid under a cover glass on a slide, typical eggs can be seen—each containing a pyriform apparatus. The record of *Moniezia* (?) *expansa* from a giraffe is, as far as I can trace, the first time that this worm has been found in this host. Witenberg's work seems to have cleared up the confusion which has existed with regard to what may be called the dog and cat tapeworms with segments like cucumber-seeds. Thus in the dog there is *Dipylidium caninum* and in the cat this species, together with *Diplopylidium acanthotetra*, *D. nolleri*, and *Joyeuxia pasqualii*. The first-named is recorded from the dog and the last two from cats, in Cyprus.

Mesocestoides perlatus occurred in a falcon, and *M. lineatus* was reported from a fox in Cyprus. From the same country came a heavy infestation of this host with the larval cestode *Dithyridium elongatum*. Some authors have connected this cyst, which is 10 to 15 mm. in length and lancet shaped, with *M. lineatus*. In the instance under notice it was found in large numbers free in the peritoneal cavity, in the mesentery, in the mesenteric lymphatic glands, pleural cavity, lungs, and aorta.

Nematoda.—*Ascaris lumbricoides* was obtained from a Malayan bear: it is usual to expect *Toxascaris transfuga* in this species. *Angusticæcum holopterum* occurred in the tortoise. It is commonly found here in this host. *Porrocæcum decipiens* was stated to be causing tumours and deaths in the stomachs of seals off Chile. The larval form of this species is often found in the musculature of edible fish. *Thelazia rhodesii*, a world-wide inhabitant of the conjunctival sac of cattle, was recorded from Cyprus. Although the common *Setaria* of equines, *S. equina*, is found in the peritoneal cavity, nearly all the records of this genus from the eyes of horses state that the worm is an immature form of *S. labiato-papillosa* of the ox's peritoneal cavity. In a like manner nematodes of the ox's eye have often been regarded as *S. equina*. The determinations have rarely been fully proved. Often the material has been scanty or not well preserved. In the present case it was not possible to make a specific determination. *Onchocerca cervicalis*, recorded from a recurrent case of fistulous withers, appears to be frequently met with in this condition and in poll evil. A mixed infection of *Gongylonema verrucosum* and *G. monnigi* was noted in the goat's stomach from Cyprus. *Trichostrongylus tenuis* appears to be an important factor in disease production in partridges. It is closely allied to *T. pergracilis*, the cause of one of the forms of grouse disease. I have previously alluded to the prevalence of numerous species of *Capillaria* in different species of birds. I think that they often produce disease and are not seen unless a microscopic examination of the bowel contents is made.

Acanthocephala.—The thorn-headed worm *Filicollis anatis* was reported to be causing deaths amongst ducks. The heads are embedded in the gut wall.

Acarina.—*Hyalomma syriacum* was found in the "armpits" of a tortoise. This is the usual species found on these pets, which are imported from the Mediterranean seaboard. A mite, *Tarsonemus* sp. was found in scrapings from the skin of a terrier and later, on *post-mortem* examination, numbers of it were found in the skin. The lesions were widespread and closely resembled those of advanced sarcoptic mange. The irritation was intense, the exact species of mite could not be determined, and its origin was not ascertained. Tarsonemids are prevalent on cereals and grasses.

A species of *Notœdres* was found on the ears of a hampster.

Insecta.—Apparently the *Hypoderma* of the goat in Cyprus is *H. æratum*, the species recently described by Austen. It closely resembles *H. crossi*, especially the subcutaneous larvæ, which give rise to warbles. Among non-sucking lice *Lipeurus heterographus* from the turkey and *Esthiopterum latum* from the rhea, were noted. A fish-tail insect, *Lepisma saccharina*, was found on the skin of a dog.

General.—A number of samples contained eggs of various species of worms. Many were negative. Surprise is sometimes expressed at finding eggs of the strongyle type in the fæces of the dog. When this happens they are likely to be *Ancylostoma caninum* or *Uncinaria stenocephala;* a few are often found in puppies, but they seem gradually to disappear.

A body of some interest in the fæces of cattle and sheep is a coccidium-like structure about 23 by 16μ, of a dark colour, with a transparent fan-like projection at one end. It is of vegetable origin.

A small piece of leather, probably from the fringe of the weighted leather portion of an ash tray for the arm of an easy chair, was found in the ear of a dog, and it was thought to be a worm. Many members of the profession will have had experiences of doctors blaming the dog as the source of worm infestation in children. Sometimes the dog has even been destroyed on the most slender circumstantial evidence. It is interesting in these cases to try and obtain the name of the parasite of the child, and even a worm or a sample of fæces. It then often transpires that the diagnosis is claimed to be purely a clinical one, *i.e.*, founded on history and symptoms such as increased appetite, picking the nose, or scratching the anus. It is rare that it is based on finding worms or their eggs in the fæces, and the specific name of the parasite is hardly ever quoted. At this stage the veterinarian often

has to retreat as he may cause a dispute, or lose a couple of good clients. There are some parasites which are common to the dog and man, but *Ascaris lumbricoides* and *Enterobius vermicularis* are not included amongst them. In one case of this kind it was shewn that a child was being treated for the thread worm *E. vermicularis* which it was alleged had been derived from a dog.

The packing and preservation of material still leaves a great deal to be desired. Worms which have remained in the cadaver for a couple of days and then forwarded in a rolled-up cabbage leaf are almost certain to be useless. Three-and-a-half pounds of fæces cause needless expense if sent through the post. Nearly all specimens can be forwarded in a little formalin solution (one part of formalin plus 19 parts of water). A few drachms of fæces are usually sufficient. A most useful brochure in this direction is "Instructions for Collectors, No. 12, Worms," British Museum (Natural History), Cromwell Road, London, S.W., price 6d.

CALF REARING WITHOUT MILK

The fact that cows calving in the late summer and early autumn give more milk in the year than those bearing their calves in the spring is responsible for an ever-increasing proportion of calvings being arranged for the back end of the year. Unfortunately milk cannot be freely offered at this time for calf rearing and the calves must either be slaughtered or reared on milk substitute after early weaning. With the object of testing methods of calf rearing, extensive trials have been undertaken for the past three years in Banffshire and (according to the *North British Agriculturist*) these have proved entirely satisfactory. When the calf is between three and four weeks old it is given about 4 ozs. daily of a mixture of five parts by weight of crushed oats, four parts of linseed cake and one part of white fish meal. The allowance is increased by 4 ozs. a week until at eight weeks of age, when the calf is weaned, it is eating readily and eagerly 1½ lbs. of the mixture a day and at twelve weeks 2½ lbs. a day. Then a change is made in the ration, the mixture consisting of six-and-a-half parts by weight of crushed oats, two-and-a-half parts linseed cake and one part of white fish meal. These mixtures are fed dry in clean pails and any not cleared up promptly removed. Feeding must be strictly punctual and the amount carefully weighed or measured at each meal. Clean drinking water must be offered three or four times each day and regular exercise outdoors allowed even in the winter. By this method of rearing the calves make steady progress, keep healthy and make fine profitable heifers or bullocks.

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At the triennial meeting of the World Poultry Science Association, which was held during the recent International Congress in Rome, the only invitation for the next Congress in 1936 came from Germany, and it was tentatively decided to hold the event in Berlin. Professor Alessandro Ghigi, of the University of Bologna, was elected President, in succession to Mr. W. A. Kock, of Denmark.

"AN APPARATUS FOR PIPETTING SERUM IN MAKING THE AGGLUTINATION TEST FOR THE DETECTION OF CARRIERS OF BACILLARY WHITE DIARRHŒA"

[Received for Publication from the Staff of the Veterinary Research Department, Stormont, Belfast]

A paper published by Beaudette in 1929,[1] under the above title, described an apparatus designed to eliminate the use of hand pipettes for this purpose. In addition to the economy in pipettes effected by this apparatus, it enabled the operator to more than double the number of samples tested than when using the hand pipette.

One of Beaudette's machines was constructed in this laboratory in 1930, but in practice certain details of its structure were found to be unsatisfactory. The most notable weakness lay in the spring clip arrangement used for closing the vacuum tube. This was replaced by a spring and plunger device, which has proved eminently satisfactory. Other minor improvements have been made which will be described.

It will be appreciated that the general description will closely follow Beaudette's, but owing to the fact that numerous enquiries have been received regarding the working of the apparatus, it is considered desirable to describe again the various features.

The apparatus consists of (1) a dipping device which allows a pipette to dip into a funnel containing carbolised saline (a vacuum permits the cleansing of this pipette automatically between filling operations); (2) a spring and plunger device to act as a stopcock when the machine is not in the dip position; and (3) a syphoning arrangement, which maintains the level of the saline in the funnel.

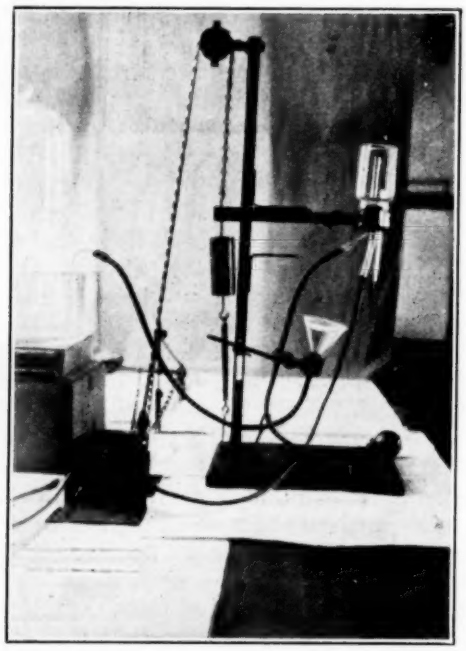
A thick glass bottle about 4-in. high is fitted with a three-holed rubber stopper. Through the centre hole a 0·1 c.c. pipette is fitted so that the proximal end is above the level of the end of the stopper. The pipette is distinctly marked at the 0·04 c.c. mark for ease in reading. Two glass tubes bent at 120° are inserted in the remaining holes. One of these reaches almost to the roof of the inverted bottle. The external end is fitted with rubber tubing terminating in a bulb (to take the place of the rubber teat on the ordinary pipette). The other tube is flush with the level of the surface of the stopper; its external end is attached to the vacuum tube. As will be seen from photographs, this vacuum tube is opened and closed by a plunger arrangement in place of the spring clip described by Beaudette.

This inverted bottle, with the tubes fitted as

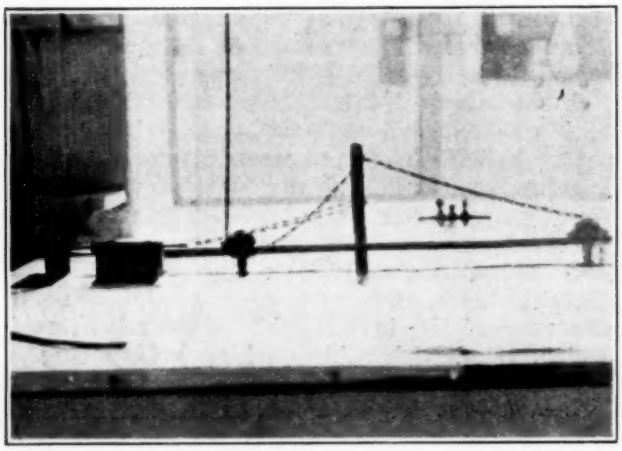
described, is attached by means of a metal clamp to a cross arm on a retort stand (see photograph "A"). This cross arm is about 14 cms. long and pivots on the upright of the retort stand with a projecting arm of 5·5 cms. The upright should be square in cross section. The cross arm is approximately 34 cms. above the bench. We find this height the most suitable for reading the pipette. The bench is 2-ft. 6-in. high. To the bolt which passes through the cross arm projection a fine chain (*e.g.*, a picture chain) is attached: the chain is passed over a pulley-wheel at the top of the upright and down to another pulley-wheel (fitted to the bench) and thence to a pivotal bar 13 cms. high, to the end of which it is attached as in photograph "B." It is then continued over another pulley and through a hole in the bench over still another pulley fitted to the underside of the bench and thence to a treadle.

In photograph "A" it will be noticed that a cylindrical weight is attached to the projecting arm by means of a hook at the point where this chain is attached. A hook attached to the end of this weight is fixed by means of a spring to the base of the stand. This serves as a counterpoise to the treadle and brings the arm back to the "ready" position, after the pipette is flushed. The cross arm is prevented from rocking upwards by a projecting arm attached to the upright as shown in photograph "C." A similar arm fastened below the level of the pivot limits the downward movement of the arm.

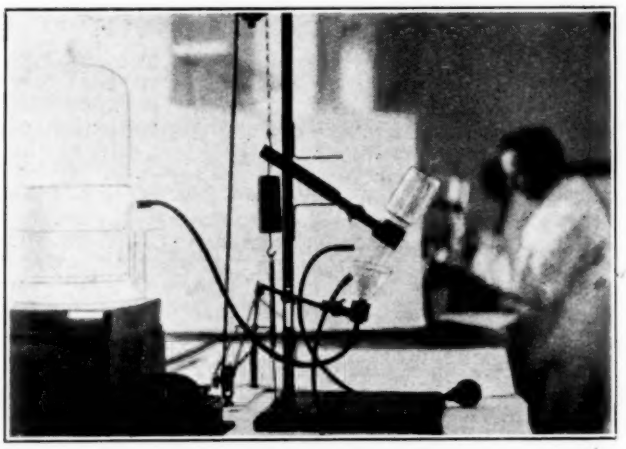
The spring and plunger device (photograph "D") is fitted to the bench in line with the



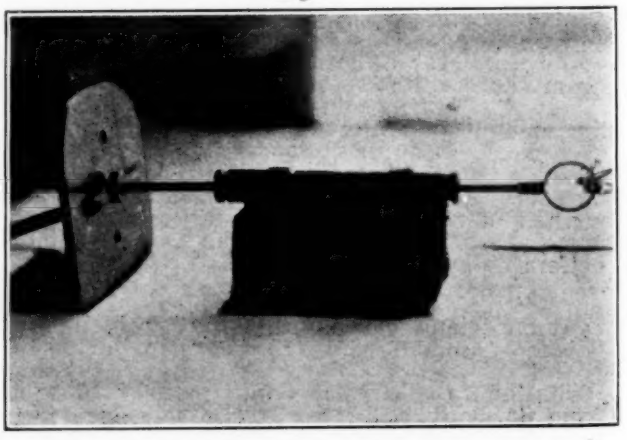
Photograph A.
Machine in "Ready" Position.



Photograph B.
Photograph showing Arrangement of the Chains and Pivotal Bar. The Chain after passing over the Pulley on the Extreme Right passes through the Bench, over a Similar Pulley (Attached to the Underside of the Bench), to a Treadle on the Floor.



Photograph C.
Machine in "Dip" Position. Note Projecting Arms Limiting Movement of Cross Arm.



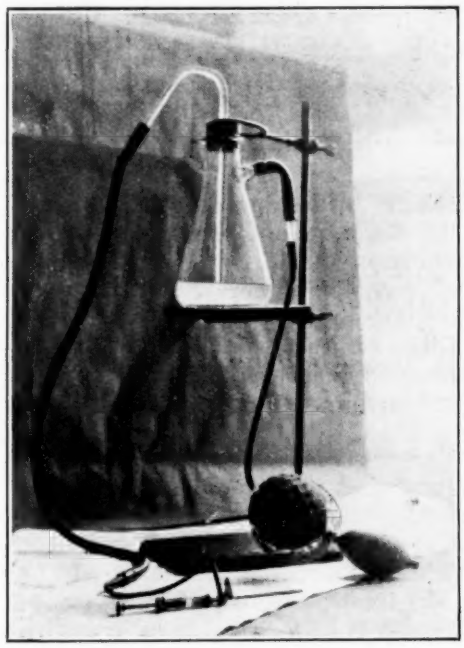
Photograph D.
Piston Arrangement Replacing Beaudette's Spring Clip. Note Tube Threaded through Plate.

pulley-wheels and immediately to the left rear of the retort stand as in photograph " C." The ring of the plunger is fastened by a chain to the base of the pivotal bar, which is fastened to the bench. The plunger head, which is operated by a powerful spring, bears against a small metal plate screwed to the bench. (The idea was suggested by an air gun spring.) There are two holes in this plate and the rubber " vacuum tube " is threaded through these across the area pressed on by the plunger head. This opens and closes the vacuum tube with the movements of the pivotal bar arm. The " vacuum tube " is attached to a water pump, which provides the necessary suction.

To complete the apparatus, a glass funnel is clamped to the upright of the stand and is so arranged that the tip of the pipette is immersed in the carbol saline in this funnel when the machine is in the " dip " position (photograph " C ").

The container which holds the carbol saline supply and feeds it to the funnel by a syphon arrangement is of the chicken drinking fountain type. It ensures a constant level of saline in the funnel.

When using the apparatus, the box containing the samples is placed to the left of the operator, and the receiving rack and a shallow box containing the sterilised agglutination tubes to the right. A blood sample tube is picked up by the left hand and the agglutination tube by the right hand. The agglutination tube is transferred to the left hand; both tubes are held upright by the thumb and first two fingers of the left hand. The rubber bulb which actuates the pipette and which is fixed to the bench on the right at the base of the stand is pressed by the tips of the fingers and the serum aspirated to the 0·04 c.c. mark and discharged into the agglutination tube. Both tubes are then returned to their correct racks and at the same time the treadle is depressed and a stream of carbol saline rushes through the pipette, thus cleansing it. Depression of the treadle pulls the chain and allows the pipette to dip into the saline funnel; at the same time the plunger is drawn back, and, a vacuum being created in the inverted bottle, a stream of saline is drawn through the pipette. The water pump also draws off the " washings " to the sink. As the next tubes are picked up the treadle is released and the apparatus returns to the " ready " position (photograph "A"); any residual saline in the pipette is aspirated during this movement. The serum tubes are then filled by means of an automatic pipette, which ejects the bacterial emulsion in 1 c.c. amounts. The automatic pipette is simply a modified 1 c.c. hypodermic syringe with a three-way cock. It is filled from a filter flask (photograph " E "), in which the emulsion is kept under pressure by an ordinary blowing ball. The force with which the emulsion is ejected mixes the serum effectively. With this automatic pipette it is possible to add emulsion to about 4,000 samples in one hour. The photograph " E " is self-explanatory.



Photograph E.

Emulsion Filling Apparatus. Note Ring on Retort Stand Clamped on top of Rubber Stopper to Prevent this Blowing when under Pressure.

The 1 c.c. automatic pipette is a product of Messrs. Baird and Tatlock (London). The rest of the apparatus is made for us by Messrs. John Clarke and Company, Donegall Square West, Belfast, and we have received reports from several workers that the apparatus supplied by Messrs. Clarke is giving every satisfaction.

In conclusion, we may say that about 400-600 samples per hour can be handled by one worker, provided the bacterial emulsion is pipetted afterwards for him.

The apparatus, in its present form, is the result of ideas suggested by several members of the staff, but Beaudette, of course, is responsible for the original idea.

Reference

[1] " An Apparatus for Pipetting Serum in making the Agglutination Test for the Detection of Carriers of Bacillary White Diarrhœa." F. R. Beaudette. Reprint from the *Cornell Veterinarian*, Vol. xix, No. 4, October, 1929.

A cow killed in a Rotterdam slaughterhouse was found to contain, when its stomach was opened: 27 medium-sized nails, two four-inch nails, two gas meter token coins, ten coins of Dutch mintage, four pieces of copper, and four drawing pins. At the time of her death the cow was in prime condition.

XUM

AN OUTBREAK OF "PARATYPHOID" IN PIGS

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Veterinary practitioners are frequently called upon to diagnose outbreaks of disease in pigs, and whilst the majority are usually classed as swine fever (hog cholera) or swine erysipelas, a number pass undiagnosed. Owing to the absence of facilities for bacteriological or other laboratory examinations it is possible that certain pigs die from septicæmia, the causal organisms remaining undetermined. In this article the writer describes an outbreak amongst pigs caused by the micro-organism *Salmonella suipestifer*—hence the Continental denomination of the disease "bacillary swine pest." However, as this may be confused with virus swine pest, *i.e.*, swine fever, the term *paratyphoid in pigs* appears preferable, and is in fact the name given by German veterinarians to outbreaks of disease associated with *S. suipestifer* as the primary causal factor. Paratyphoid in pigs was differentiated from swine fever by Glasser, in 1907, but there appear to be few, if any, records in English journals of pure *suipestifer* infection as a distinct pathological entity.

It is important at the outset to understand clearly the relationship between this disease, swine fever, and swine erysipelas. The latter ailment is unrelated (except that it is a septicæmic disease of pigs), since the causal organism—*B. rhusiopathii suis* bears no resemblance to that causing paratyphoid in pigs, although certain clinical features may be common to both diseases.

Swine fever is known to be caused primarily by a virus, but micro-organisms, including *S. suipestifer*, appear to play a definite rôle as secondary invaders. Paratyphoid disease in pigs is a bacillary disease, unrelated to any virus, and caused by *S. suipestifer*.

It is generally believed that healthy pigs harbour germs in their intestinal canal which are capable of causing disease if allowed to penetrate the mucous membrane. Amongst these germs are *S. suipestifer* and *B. rhusiopathii suis*. Under certain conditions the vitality of the body in general, or the digestive tract in particular, becomes lowered, which is followed by the pathogenic activities of the particular species of micro-organism present in the alimentary canal, and ill-health follows. Nutritional errors, chills, and disease factors, such as worms or virus, are understood to be important in lowering vitality. In the case of *S. suipestifer* if the virus be that of hog cholera, then swine fever will follow; otherwise, the disease which will develop may be termed paratyphoid in pigs.

On the farm in question, which contains about 700 pigs, small losses from disease have been encountered for several years; they have never been great, but the affected animals which recovered have always lost flesh and, therefore, economically the position was serious. Swine fever was diagnosed by the Ministry of Agriculture some years ago, but several specimens sent by the local inspector to this authority in March of this year were returned as negative for both swine fever and swine erysipelas.

The disease in typical form appeared to attack suckling pigs aged two to four weeks, and also young growing pigs aged about ten to 16 weeks. In the younger pigs the chief sign was a yellow diarrhœa, inability to thrive, and in certain cases death. As treatment, the pigman had been in the habit of administering strong doses of sulphate of iron in solution. This cleared up the majority of the cases of diarrhœa, but occasionally some of the animals died, whilst those which recovered never put on flesh as rapidly as pigs from non-infected litters.

The second typical manifestation of disease on this farm affected older pigs, a few days or weeks after they had been weaned. The affected animals seemed to find difficulty in walking, spending much of their time lying down. A yellowish diarrhœa was frequently present, but as a contrast, some pigs showed respiratory rather than digestive symptoms—the breathing being rapid and pronounced, with occasional fits of coughing. Dark scabs, varying in size from that of a pea to that of a half-crown piece, were frequently to be seen and characterised the disease. They were present on all parts of the body, but chiefly around the ears, sides of chest, belly and inside the hind legs.

Two ailing pigs were removed to the above Laboratories for observation, but one died the following day, and the second a day later (June 3rd, 1933).

Post-mortem Findings

Pig No. 1.—Pneumonia was present, about a third of each lung being hepatised. Other portions of the respiratory tract appeared normal. The liver showed areas of congestion, and the spleen was enlarged, whilst the kidneys presented fine patechiæ. The stomach was in part hæmorrhagic, whereas the intestines showed numerous necrotic areas, especially the colon, and also much inflammation. The mesenteric vessels were congested. A deep ulcer, covered by yellow necrotic material, was present in the large intestine.

Bacteriological Examinations.—Cultures were made from the heart, liver, spleen and bone marrow on to agar and broth. In each case, a growth appeared after 24 hours' incubation. Smears stained by Gram showed numerous Gram negative, pleomorphic bacilli. The sugar reactions were as follows: lactose, saccharose,

dulcite, and inosite, negative; glucose, maltose and mannite, acid and gas.

Pig No. 2.—Small subcutaneous hæmorrhages. Pericardial fluid increased, cardiac vessels congested. Bilateral apical pneumonia. Spleen congested; liver showed purplish patches. The stomach was inflamed, and the small intestines showed patechiæ. Extensive necrotic, irregular areas were present in the large intestines, but there were no ulcers present. The mesenteric vessels were congested.

Bacteriological Examinations were carried out from the heart blood, liver, spleen, bone marrow and intestines. In each case an organism identical with that obtained from Pig 1 was recovered in pure culture (except in the case of the intestines, where the growth was contaminated). It was believed to be *S. suipestifer*.

EXPERIMENTS

In order to determine whether this bacillus was the causal factor in the disease investigated, two healthy pigs were obtained from the same farm but from separate litters. Both were about the same age, namely seven weeks. One was inoculated (July 4th, 1933) intramuscularly (cervical region) with 1 c.c. saline washings of an agar slope (24 hours' growth—*ex* Pig 1), whilst the second was left uninoculated. Four days later the injected pig died after being "off its food" for 36 hours. The fæces of this pig were semi-fluid in consistency and yellowish in colour.

Post-mortem Findings.—Externally the skin showed a large number of purple-brown scabs, the surface of which exfoliated easily, leaving below the deposit a deep purple area of congestion. The scabs were present inside the thighs, down the front of the cannon bones (hind), by the side of the mouth, along the breast bone and also on the side of the chest and point of the shoulder. The ears were purple compared with the rest of the external aspect of the carcass. Two species of lice were present.

The pre-sternal and mesenteric lymph glands were enlarged and deeply congested. The liver, heart, spleen and rectum were congested, whilst the first-mentioned organ was also fibrous in consistency. The lungs, kidneys and adrenal glands were normal, but the stomach showed a large area of inflammation, particularly in the region of its larger curvature. The bile was thickened and contained a fine amorphous deposit. The intestines were relatively normal, except that the solitary follicles associated with the ileo-cæcal valve contained pale-yellowish masses which were extruded by pressure.

Bacteriological Examinations.—These were made from the spleen, bile, mesenteric lymph glands, kidneys and heart blood and in each case a typical growth of organisms was obtained—these gave the same sugar reactions as before, *i.e.*, glucose, mannite and maltose, acid and gas production.

The clinical signs associated with this pig, together with the external appearance at *post-mortem* examination, were known to be identical with those seen in previous cases encountered during natural outbreaks of the disease and, therefore, it appeared that the original cause of the ailment had been identified, *i.e.*, *S. suipestifer*. The uninoculated, second pig and the remainder of the pigs of the litters from which the experimental pigs were obtained remained quite healthy and exhibited no typical symptoms.

As a confirmatory measure the second pig was injected ten days later with 1/10 c.c. *suipestifer* culture *ex* 24 hours' growth on agar. The animal died four days later, again showing yellow diarrhœa and the development of skin lesions characteristic of the outbreak.

In order to assist the farmer concerned, a dead vaccine was prepared containing about 400 million organisms per c.c. Young pigs on being weaned, received 1 c.c. of this vaccine intramuscularly. So far, 131 pigs have been inoculated without further appearance of the disease, but this, of course, does not necessarily mean that the vaccine has been solely responsible for this apparent success.

Possibly the organisms on the infected farm have increased their virulence by constant passage through pigs of successive litters, and exert their disease-producing effects on animals with lowered vitality. In the outbreak described, nutritional factors unquestionably influenced its development, for the pigs are reared away from direct sunshine, receive no green food, and rely entirely upon dried milk as their source of vitamin D. Further, the mineral content of the ration appears unbalanced.

To imitate the disease proper more correctly, it would be interesting to feed the organisms to healthy young pigs on the farm, for by this means the course of the disease would probably be delayed and alimentary changes be more pronounced.

Summary

From observations and experiments it appears reasonable to conclude that the organism isolated (*S. suipestifer*) was capable of causing disease in pigs. The symptoms exhibited by ailing animals probably depend a great deal upon the method of transmission, *i.e.*, ingestion or inhalation. In the former instance necrosis and inflammation of certain parts of the digestive tract will follow, whereas pneumonic symptoms more probably occur if the organisms have been inhaled.

If swine fever and swine erysipelas can be excluded from the diagnosis of outbreaks of disease amongst pigs, it should be remembered that

(*Concluded at foot of Col.* 1, *page* 971.)

XUM

Clinical Communications

INVESTIGATION INTO AN OUTBREAK OF TUBERCULOSIS IN SWINE

H. E. BYWATER, M.R.C.V.S.
Veterinary Officer, County Borough of West Ham

I was requested, at the end of 1931, to investigate an outbreak of tuberculosis amongst swine on a farm attached to a tuberculosis sanatorium. Pigs which were born and reared on the farm, when fat, were sold to the local butcher, who complained that over a period many of these animals had been condemned, either partially or totally, by the local meat inspector. I arranged to attend at the slaughterhouse when the next batch of pigs was sold; and out of six pigs two were found to have generalised tuberculosis and the other pigs were all affected in varying degrees. The lesions suggested that the mode of infection was the usual one in swine, namely, by ingestion, and was, in all probability, due to the bovine bacillus.

A visit to the farm revealed that the pigs were allowed access to a meadow where it had been the practice to turn out sick cattle and where also, since an attempt was being made to establish a tuberculin-tested herd, the reactors had been grazed. The pigs were fed with swill from the sanatorium and a large number of poultry had free range over the farm and were frequently to be found in the pig-styes. Normally, all swill was thoroughly boiled, but upon questioning the pigman doubts were entertained as to the efficiency of the boiling process during the week-ends, and the necessity for the swill to be always thoroughly boiled was stressed. Milk and its derivatives were never fed to the pigs.

It was not possible, for reasons of economy and farm management, either to confine the poultry or discontinue keeping them. There was, however, no history which would lead one to suspect the existence of tuberculosis amongst the poultry and so 20 fowls were selected at random and subjected to a single intradermal tuberculin test; ·2 c.c. of avian tuberculin being injected into the wattle. Not a single bird showed the slightest reaction at either the 24th or 48th hour and so the poultry were considered not to be the source of infection. By way of interest, rather than of practical help, a boar and four sows were also tuberculin tested both with avian and bovine tuberculin. The dose was ·2 c.c. in each case and was injected intradermally at the base of each ear without undue trouble. Separate syringes were, of course, used for the two tuberculins. At the 24th hour a distinct reaction was noted in all the animals from the avian tuberculin, the reactions being very typical—diffuse, red to purple, painful, and of large size. The reactions from the bovine tuberculin were of smaller size, although positive. At the 48th hour, however, the avian reactions had decreased in size and character (although still reactions), but the bovine reactions had increased and equalled the avian reactions at the 24th hour. A second injection was not considered necessary.

The tuberculin was supplied by Dr. Sheather, to whom some lesions from the condemned pigs were sent with a request that he should endeavour to differentiate the type of bacillus responsible for the outbreak. Meanwhile, instructions were given that the young pigs were not to be allowed outside the styes.

Dr. Sheather later reported as follows:—

> "My cultural examination of the material from the tuberculous lesions in the pig which I received from you on November 5th is now complete and the results, coupled with the nature of the lesions, lead me to think that it was the bovine type of bacillus that was responsible for them."

It is now the practice to keep all young pigs confined to the styes from birth until they make the journey to the butcher, and the results have been extremely gratifying, for it is now only on rare occasions that infection is found amongst the pigs and when it has been noted it has been limited to the submaxillary glands only.

In certain parts of America, especially in the "Corn Belt," it is the practice to graze the pigs over land either with or after cattle and it is not uncommon in such cases to find tuberculosis in the swine so fed, due to infection from bovine fæces.

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OSTEO-SARCOMA OF THE HEAD OF THE HUMERUS OF THE DOG

A. R. SMYTHE, F.R.C.V.S., D.V.S.M.
Falmouth.

Subject.—Cross-bred fox-terrier which had been brought home from India.

The dog had been going lame for five or six months. It was thought by the owner that he had dislocated his shoulder at some previous date. When first examined he had a well-marked enlargement involving the scapulo-humeral joint, rather larger than a hen's egg, and more noticeable on palpation of the inside of the joint.

Some pain was evident on pressure, and it was decided to X-ray the joint. The photo shows

a pure *S. suipestifer* infection may be present—particularly if young pigs are ailing, losses are not great and the affected animals exhibit diarrhœa (yellow), purple-pink ears and "scab" formation. Vaccine treatment may be attempted for prophylactic or curative purposes.

the extensive absorption of the head of the humerus which, during life, contained a soft, paleish pink, neoplasmic tissue, which also surrounded the joint. The scapula was also slightly involved.

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ENCHONDROSIS INTERVERTEBRALIS IN A LABRADOR

A. R. SMYTHE, F.R.C.V.S., D.V.S.M.
FALMOUTH.

This condition has been described by various Continental authors as occurring in dogs, and the following case recently came under treatment.

A Labrador retriever, seven years old, used mostly for sporting purposes, developed a stiffness in the cervical and lumbar regions and evinced his dislike of movement by emitting the most awful shrieks on being disturbed or touched.

The condition was very suggestive of acute rheumatism, but failed to respond to any form of treatment. On the contrary, it became slowly worse, but rather more localised to the cervical region, so that the patient's movements became slowly more restricted. Eventually he lay flat on his side and any attempt to alter the position of the dog was interrupted by the most prolonged and piercing shrieks.

All lines of treatment, including medicinal, local and mechanical fixation of the spine, proved abortive, and the dog was eventually put to sleep. Previous to this, X-ray examination had shown some alteration in the density of the intervertebral discs between the second and third and third and fourth cervical vertebræ.

Post-mortem examination showed these discs to be altered in composition and to be calcified through the greater part of their substance. Unfortunately, lack of time prevented a dissection of the dorsal region, but there is no doubt that this region was clinically similarly involved, but to a less extent.

A CASE OF STUTTGART DISEASE IN A BULLDOG

A. R. SMYTHE, F.R.C.V.S., D.V.S.M.
FALMOUTH.

From time to time one meets with outbreaks of a disease in dogs which is characterised by gastro-intestinal disturbance.

In this neighbourhood, such an epidemic occurred during the end of 1931 and the early months of 1932. This subsided, but recently the disease has again been prevalent.

The author has observed these outbreaks both in London and in the country, and probably they are widespread throughout the British Isles.

Usually the dog is observed to be unwell for a day or so, and then frequent vomition of a mucoid bile-stained fluid is seen.

Less acute cases occur where vomition is entirely absent, and, on the other hand, the condition may be complicated by troublesome diarrhœa. The temperature is usually elevated during the early stages, but generally subsides early in the disease.

The proximal end of the tongue is usually of a somewhat brownish hue, a point which sometimes helps in diagnosis.

Generally these cases clear up in five or six days and appear to leave no after effects.

The etiology of this condition is somewhat obscure. One sometimes wonders whether the proximity of the dog to the cold and damp ground favours the onset of this condition, or whether it is due to some specific organism or virus. It certainly appears to bear no relationship to distemper, but corresponds closely to the contagious gastro-enteritis which is so fatal in the feline tribe. Fortunately, in the dog the percentage of recoveries is very high, but one does meet with cases where complications arise. The commonest one would appear to be Stuttgart disease, although chronic nephritis may also supervene.

Some time ago a bulldog, during the height of an epidemic, came under treatment. This animal, six years of age, had been twice operated on for urethral calculi. On the fifth day of its illness, when improvement in his condition was expected, he appeared somewhat worse, and examination of his mouth showed a suspicious hæmorrhagic discolouration of the tip of the tongue.

After the lapse of another 24 hours, there remained no doubt that the animal had developed Stuttgart, but fortunately the characteristic staining of the vomit was absent. During the next ten days an inch-and-a-half of the tip, and two-and-a-half inches on either side of the tongue sloughed, and these portions were gradually removed. Deep, necrotic patches involving the angle formed by the junction of the upper and lower lips also became evident, and the

whole of the under surface of the body covering the sternum and abdomen became involved in a patchy necrosis.

The dog was fortunate in having a devoted and sensible mistress, who nursed him night and day.

The treatment adopted was principally that of cleaning up and deodorising the necrotic lesions, and towards the end of the illness it was necessary, on one occasion, to give an anæsthetic so as to have a general clean-up.

During the whole of the illness the dog hardly missed a meal, and is now in perfect health. His tongue, once long enough to act as an efficient pocket-handkerchief, now reaches to the edge of his lips, and he has had to re-educate himself in the arts of imbibing and wiping his nose.

Nourishment consisted chiefly of that very excellent food for sick dogs, Virol in the dessicated milk form, and a liberal allowance of good old port did much towards keeping up the spirits of our patient.

During his illness the mouth was repeatedly swabbed with a very dilute solution of the liq. sodæ chlorinatæ, one of the most useful of the disinfectant series in canine practice. General treatment was symptomatic and simple.

The case is recorded, as it shows that very severe Stuttgart disease can occur without the gastric mucosa being seriously involved.

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AN UNDIAGNOSED CASE IN THE HORSE

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Subject.—A grey pony mare of the Somali type, about seven years old, born in Kenya. Had been used for hacking and polo in the Southern Highlands of Tanganyika Territory.

Symptoms.—She was seen by the writer for the first time on March 16th, 1933, with the meagre history of not being well. No further particulars were available as the owner was away from home.

The pony presented a fairly bright appearance and she was in fair condition, slightly tucked up, and had a clean skin. Respirations were a little shallow, pulse thin, regular and not quickened. Temperature 102·2°F. She could get up and lie down, was eating, and the bowels were on the costive side. She walked slowly and stiffly from lameness in the near hip and near shoulder but there was no swelling in either place. Palpation *per rectum* showed nothing unusual.

Microscopical examination of blood-slides from the ear was negative for parasites. Fæcal examination showed a few strongyle eggs.

Sodii salicylas, digitalis and nux vomica were exhibited together with small repeated doses of linseed oil. Soap liniment was prescribed for rubbing the shoulder and hip.

The mare was seen again three days later. Her general condition was not so bright; temperature 102·4°; still feeding. Otherwise not much change was observed. A tentative diagnosis of acute rheumatism was given. Blood-slides were again negative.

The patient was not seen again until April 5th, 1933, that is, 17 days after the second visit. On this date she was decidedly worse. She was more tucked up; her respirations were shallower and slightly quickened, the pulse was still thin, the temperature 102·2°, and lameness was more pronounced, with some swelling of the near hip joint. She was still feeding, but not heartily.

The most noticeable change was the presence of small well-defined swellings in the subcutaneous tissue, about 20 in number and varying in size from that of half a marble to that of half a walnut. These swellings were dotted over the sides of the body, brisket, fetlock and hip. They did not follow the course of the large lymphatic vessels nor did they appear to be in any way connected with them. The swellings could be picked up between the finger and thumb, were hard and not painful. They showed no tendency towards spontaneous rupture. Incisions into them with a sharp scalpel let out a thick, creamy pus, very slightly blood-stained and non-fœtid. The pus cavities were lined by a thickened granular membrane which, on scraping, bled slightly. Blood smears from the ear were still negative and microscopic examination of the pus failed to show any parasites.

It was decided to bring the mare into the town by motor lorry, and she arrived there on April 11th, 1933. She travelled well. The animal became gradually worse. The small swellings increased in number, especially in the region of the brisket, and they were now about 50, all told. They showed no tendency to coalesce, nor did they increase in size. The mare was now gradually losing her appetite, liked to lie down for long periods and exhibited great pain in the hip joint, hock and fetlock. The visible mucous membranes were slightly but definitely icteric and the temperature varied from 102° to 103°.

Mr. H. E. Hornby kindly visited the mare on April 17th, 1933, and it was decided to destroy her. She was shot on April 18th, 1933, after an illness lasting more than 35 days.

Post-mortem.—This was carried out immediately. The carcass was thin almost to emaciation. Removal of the skin revealed that all the swellings seen in life contained the same thick, creamy pus. Mouth and nose showed nothing unusual. The heart was larger than normal and flabby, and the heart muscle was browned and softened. The pericardium exhibited no abnormality, nor did the lungs and trachea. The liver

was of a darker colour than normal and friable, but careful search showed nothing else unusual. Spleen, pancreas and adrenal bodies were normal. The stomach and intestines contained a fair amount of food material; a few strongyles were found, otherwise nothing was amiss. No collections of pus were seen, except in the subcutis. The near hip joint contained an excess of very yellow, thickened, synovial fluid and the articular surfaces were reddened. The near hock, fetlock and shoulder joints presented the same findings as did the hip, but in less degree. The other limb joints were normal.

Following is the pathologist's report on the pus, both *ante-mortem* and *post-mortem*: "I examined the pus from the mare but failed to see any organisms at all—only pus cells. I can think of no plausible theory to cover the case."

This case is recorded because it remains undiagnosed and is the first of its kind seen by either the writer or his experienced consultant.

Review

[**The Bursate Lungworms of Domesticated Animals.** Cameron, T. W. M. (1933). *Imperial Bureau of Agricultural Parasitology Publication,* pp. 1-36, 2 tables, 133 refs.]

Progress in our knowledge of the lungworms of domestic animals has, during the past few years, been particularly rapid. Important discoveries have been made in their life histories, as well as in their systematic arrangement and their affinities with other groups of parasitic worms. A good share of this valuable work has been contributed by Cameron who, in this memorandum, reviews the present position of our knowledge of the subject. He deals with the classification of the various groups, and gives an account of the morphology and life history of each species, and the treatments and methods of prevention which have been advocated; a few general notes are also given on diagnosis, and on the technique used in the examination of fæces for the larvæ. In agreement with others who have specialised in the subject, he finds treatment to be of comparatively little value, and advocates careful attention to preventive measures. Iodine, pyrethrin and high-coefficient phenol are thought to be the three best drugs for intratracheal injection, and special stress is given to the importance of good feeding and housing, and particular care with young animals. In his opinion, the economic loss from lungworm infestation is at least as great as that from liver rot.

This memorandum should be very useful to those who wish to know something of the recent work on lungworms but have neither the time nor opportunity to consult the numerous original publications.

Abstracts

[**Mercury in Therapeutics.** (Trans. title.) Cordier, D. (1933). *Recueil de Méd. Vét. de l'Ecole d'Alfort,* cix, No. 8, 449-466.]

The author gives a very full introduction to his subject from the chemical viewpoint, with structural formulæ throughout the article.

Inorganic Hg salts are divided into monovalent (mercurous) and bivalent (mercuric).

Organic salts are also divided into two main groups: (1) A group in which two organic radicals are joined to one of Hg by an atom of carbon in each case. These are insoluble in water, with the exception of those alkaline salts whose organic chains are endowed with an acid property; (2) A type in which Hg is joined as regards one of its valencies as above, but the other valency is joined to an inorganic, or to an electro-generative organic radical. Most of these compounds are insoluble in water (some slightly soluble). The Hg is partially detachable under diverse influences, which is most important from the point of view of the physiological action and toxicity of the particular salt.

Pharmacodynamics of Mercurial Compounds.—This study shows how ionisation of Hg compounds leads to their biological action, and an understanding of their therapeutic uses. In an ionised state Hg is one of the most toxic substances known for the living cell, the free ions being capable of combining with cell albumens, causing coagulation with loss of cell function. This places the Hg ion among first-class antiseptics, but being without therapeutic electivity against tissue cells and microbes, it is difficult to employ.

Inorganic compounds act always in proportion to their Hg content (Fourneau). No therapeutic action occurs without ionisation, efficiency being parallel to their toxic action.

Organic compounds, however, admit introduction of Hg in a form called "dissimulated." Generally these products are so stable that ionisation does not occur, and they pass through the body almost as an inert substance.

It is important to know the composition of the organic radical. Thus if it be of the fatty acid range, a very toxic product is formed, because of its instability after administration. On the other hand, junction with a benzene group conduces to stability, while if two such groups are present stability is entire, and the product inert.

Two benzene rings permit the fixation of other groups upon them, *e.g.,* antispirillary derivatives as well as non-toxic groups.

Fourneau and Villa have shown that the manner of attachment of the various groups that can thus be joined greatly influences the stability of the product in its passage through the body, and according to the degree of dis-

XUM

ruption, so the freed Hg manifests its characteristic toxicity.

Synthesis of organic and inorganic Hg compounds opens up a wide field of research. Those obtained in combination with arsenic and bismuth show a trend towards elective specific action upon micro-organisms. The Hg is only "half dissimulated" and therefore toxic. This type of compound has greatly increased the number of antiseptics and diuretics.

All inorganic Hg salts cause diuresis by an irritation of renal parenchyma if the action is slight, but if strong, nephritis is produced; the diuretic dose closely approximates the toxic dose, however.

With "half dissimulated" inorganic Hg compounds, the therapeutic dose is quite apart from the toxic one, although they are not devoid of all toxicity.

Therapeutic Uses of Hg. and its Derivatives.—There are two main uses for these products. The toxic power of Hg renders it an antiparasitic and antiseptic agent, when it is used so that the tissue cells of the host are attacked in the least possible degree. Otherwise they are used for the subject itself, as external dressings or medicines (blisters, purgatives, diuretics, etc.), but in all cases toxic action must be supervised.

(A) Action of Hg on the Lower Organisms.

(1) *On Bacteria.*—Pasteur first showed that metallic Hg was inert against bacteria, while Dulché and le Dantec found the same for its gases. But those compounds capable of yielding Hg ions form the strongest group of bactericides.

The Hg ion acts upon protein constituents of protoplasm and cell envelope (coagulation and decoagulation). Bactericidal action of Hg salts is not due to actual Hg content, but to capacity for ionisation, *i.e.*, their Hg ion content (Dreser). The chloride of Hg is more antiseptic than the bromide because it is more readily dissociated at the same molecular concentration. The cyanide, being scarcely dissociated, lacks antiseptic action. Anything that reduces ionisation, also affects antiseptic action of Hg salts. It was thought that the addition of NaCl to a $HgCl_2$ solution increased its antiseptic action by augmenting its solubility and lessening precipitation of proteinates of Hg. But both salts have Cl ion in common, and ionisation of the Hg salt is actually decreased, while a double chloride of Na and Hg or a chloromercuric acid is produced, leading to the formation of complex ions. Experiments of Kronig and Paul prove this (the higher the concentration of NaCl added, the less the antiseptic action of $HgCl_2$ solution used).

Of inorganic Hg salts, three only need be considered—the chloride, the cyanide and the biniodide. None have a quick action on spore forms.

Certain conditions influence antiseptic action: the addition of a common ion in another electrolyte, as explained above; acidity of medium favours action; raising of temperature above 36°C. progressively increases the action of mercuric chloride; albumens and other organic substances hinder action, *e.g.*, cotton or wool. The species of germ to be destroyed is important (1 in 100,000 sublimate kills cholera bacilli, but 1 in 4,000 is necessary for streptococci and staphylococci).

Many antiseptic organic Hg salts are mentioned, and the same influences apply to them.

(2) *Action on Parasites.* (*a*) Protozoa.—Mercuric medication against *Treponema pallida* has been known for several centuries. Administration of Hg itself has been by ointments, intramuscular injections or orally. For Hg salts, routes used are oral, intramuscular, subcutaneous or intravenous.

Launoy and Levaditi, working with a "dissimulated" Hg salt, have shown its safety and efficiency against spirochætes and treponema in experimental animals.

Apart from this class of Hg salt, none has shown specificity against other protozoa, but synthesis of new organic compounds may lead to other specific therapeutic agents.

Certain authors oppose the theory of direct specificity, and say it is "a stimulation of tissues towards antibody production" (Kreilich), or "a modification of tissues towards rendering them unsuitable for the development of the parasites" (Kolle). On the other hand, certain protozoa may be adapted to a concentration of mercurial toxins 75 times greater than are tolerated normally (Noguchi and Akatsu), but toleration is only of short duration, disappearing after a few passages in normal media.

Such an *in vivo* condition of tolerance may arise (Launoy and Levaditi), as Erlich found in the case of arsenic.

(*b*) Action on Ecto- and Intestinal Parasites.—No Hg preparation can be classed among most active antiparasiticides of this class.

(B) Therapeutic Actions of Mercury.

(1) *Local Application.*—Used for indolent conditions externally as blisters (*e.g.*, biniodide of Hg, for acute tumefactions), various Hg ointments, and also for eye affections (calomel as a powder, and the yellow and red oxide ointments).

(2) *Purgative Medication.*—All mercury intoxications, whatever the administrative route, cause purgation. Only one salt has been used therapeutically, as it shows minimum toxicity (calomel). From various quoted experimental findings, the author concludes that the action is produced by an irritation of intestinal cells causing a phlogenic action and increased peristalsis. It is not a chologue: bile is not increased, *but* biliverdin present in the intestines is not converted into urobilin, because Hg ions inhibit the action of intestinal flora as reducing agents.

This inhibition accounts for the greenish appearance of the fæces after calomel administration.

Very little calomel is absorbed and it is an excellent purge for carnivora. Contra-indications are nephritis, gastro-enteritis, or when constipation is due to paralysis caused by peritonitis.

(3) *Diuretic Medication.*—In the sixteenth century Paracelse noted the diuretic action of Hg salts. In 1886 Jendrassik used it for dropsy of cardiac origin, and also said it was only of use in such cases (latter assertion disproved).

Organic salts, having less irritant action on renal cells, are those used, being usually of the "half dissimulated" variety. The most important are cited, together with experimental findings. Toxicity depends entirely on the mode of fixation of Hg in the molecule, while the diuresis provoked may be greatly influenced by slight alterations in the build of the molecule.

The diuresis leads to increase of water and chlorides, while urea is reduced. Decrease of urea eliminated is due to irritation of renal cells by Hg (Blum).

There are three theories of the diuretic action of Hg compounds:—

(*a*) *Extra Renal Action.*—Mercuric diuretics cause loss of moisture and Cl by tissue albumens, and this is passed into the blood (Bohn, Nonnenbruch, Noguchi). After dosage with Novasurol, refractive examination and calculation of Cl in the blood show that such increases precede and determine diuresis.

(*b*) *Renal Action.*—Many experiments (notably those of Schmidt and Noguchi on the isolated kidney of the frog; Lemesic and de Kayser on the isolated kidney of the rabbit and the dog; and recently those of Goværtes) show that Hg preparations act directly upon the kidney.

(*c*) *Mixed Action.*—Certain authors think that Hg preparations act not only upon the kidneys and tissue cells in general, but also on hepatic cells in particular. Clausen even suggests they form a combination with the bile, which is then evacuated into the intestines, its resorption determining diuresis. This is why such medication should not be used in hepatic insufficiency.

These diuretics give good results in cardiac dropsy and in diabetes with œdema, but action is only up to 48 hours' duration. They are contra-indicated in acute kidney diseases, in febrile conditions or when hæmorrhage is feared.

As soluble organic compounds (compare the sublimate) have no coagulating action on albumens, they can be used intravenously. The intramuscular route is most used in man, but on account of aqueous solutions of these diuretics being very alkaline, is sometimes very painful. The addition of theophylline lessens pain and aids resorption.

In Germany, intraperitoneal injections have been found painless, without danger and very efficient.

Lastly, chloride or bromide of ammonia reinforces diuretic action. Berger thinks this is due to the acidosis produced, because otherwise their action is antagonistic to the promotion of diuresis with the Hg salts.

C. V. W.

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[Clinical Researches on Infectious Anæmia of Horses: Vaccination Experiment. Quentin, M. *Rev. Gen. de Méd. Vét.*, Vol. xvii, No. 498.]

A study of the disease was made over a period of twelve years and vaccination experiments were carried out during the last three. The etiology of the disease and several outbreaks which occurred during the war are fully described. The forms in which the disease manifests itself, pathological anatomy, diagnosis on living animal and on the carcass, and experimental diagnostic methods are dealt with; also therapeutic treatment, chemiotherapy, vaccine therapy, prophylaxis, sanitary measures, etc. The vaccine used was formalised virus—two injections 100 c.cs. subcutaneously, with a month's interval. The effect of vaccination on the animal is described and it is reported that good results have been obtained with this vaccine so far.

D. W. M.

MEAT INSPECTING POWERS

Cardiff Corporation has considered the Sections relating to the inspection of meat contained in the Bristol and Sheffield Local Acts, and referred the question of seeking similar or greater powers in the proposed Parliamentary Bill for the inspection of meat brought into the city from outside areas, with special reference to a clearing-house for such meat, to the Health Committee. At this Committee the Town Clerk reported upon this question and submitted copy of a clause, in similar terms to the Sections contained in the Bristol and Sheffield Local Acts, included in the Norwich Corporation Bill which had received the Royal Assent. The Parliamentary Committee was recommended to include in the next Parliamentary Bill a clause providing for the inspection of meat brought into the city from outside areas upon the lines of the clause in the Norwich Corporation Bill.

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At the meeting of the British Association at Leicester, Dr. Alexander Lauder, Professor of Agricultural Chemistry at the East of Scotland Agricultural College, in his presidential address, said: "Much work will require to be done to educate the consumer to appreciate the superior value of fresh home-grown food as against that which has been chilled or preserved. It is quite certain that the consumer will not purchase home-grown produce for sentimental reasons: he will have to be convinced that the quality is better and that he is getting equally good value for his money."

XUM

Reports

STATISTICAL AND GENERAL REPORT, ARMY VETERINARY SERVICES, 1932-1933

The average strength of the Army in Great Britain and Northern Ireland during the year was 13,085, of which 11 per cent., or 1,377, were remounts. Admissions for treatment were 86·95 per cent. of the average strength and wastage for veterinary reasons 5·78 per cent. Three hundred and eighty-two mules were borne on the strength of the Army in Great Britain and Northern Ireland and admissions for treatment were 34·29 per cent., with a wastage for veterinary reasons of 2·87 per cent. of average strength.

The general health of the horses in the Home Commands is very satisfactory, attributable to the great interest shown by units and formations in horsemastership, the close co-operation between units and executive veterinary officers, and the policy of the treatment of remounts and debilitated cases for worm infestation.

The admissions for general diseases, of which fever simple and debility were the chief causes, numbered 537 as against 781 last year; respiratory sickness, 844 cases as against 1,091 last year; digestive disorders, 1,793, as against 2,270 last year; worm infestation amounting to 1,268 cases; skin diseases, 715, as against 779 last year, only one case of psoroptic mange occurring. Surgical conditions were reduced to 1,402 from 1,441 the previous year, and injuries from 5,905 to 5,642. Specific diseases numbered 216, as against 608 the previous year, 201 cases being strangles. There is nothing in the matter of disease amongst mules which calls for any comment.

The strength of the British Troops in Egypt was 1,914 horses and 743 mules. The wastage for veterinary reasons in the former was 6·05 per cent., and in the latter 1·61 per cent. Admissions for treatment were 94·88 per cent. and 68·90 per cent. respectively. The condition of all animals of the Command is very good, and the standard of horsemastership high. One case of glanders occurred in a horse and one case of horse-sickness in a mule.

Trailers attached to motor lorries for evacuating sick animals in the Aldershot and Southern Commands, and also in Egypt, were used with satisfactory results.

Five courses of instruction were held at the Royal Army Veterinary School, Aldershot, during the year, two in animal management for officers of the combatant branches of the service (four weeks each), two in animal management for N.C.O.'s (six weeks each), one for T.A. officers R.A.V.C. (13 days). There were only four failures under the first two sub-headings, and a good number of passes with distinction.

In the laboratory 1,604 examinations were made, the greater proportion (1,245) being for helminth ova infestation. Doses of stock catarrh vaccine to the number of 3,590, 194 doses of autogenous vaccines, 572 doses stock pustular dermatitis vaccine, and 4,810 c.cs. spleen extract were prepared and issued. Three hundred and twenty-eight doses of anti-tetanus serum, and 33 doses tuberculin were also issued. During the year 2,146 doses of subcutaneous mallein and 6,425 doses I.D.P. mallein were issued, all being prepared in the laboratory.

During the first five months of the year, 211 X-ray photographs were taken, but owing to a breakage of the tube, radiological work had to be suspended in August; considerable alteration having been made in the stand and tube box, however, the apparatus is now in working order and giving satisfaction.

At the School of Farriery, Aldershot, 96·2 per cent. of the pupils qualified as Farriers Class III, the average period of each pupil under instruction being 6·4 months. Ten examinations were held during the year. In Productive Work, the number of horses shod during the period was 2,663, the number of shoes "put on" 10,169, and the number of shoes made 3,665. J. M.

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SURREY COUNTY COUNCIL

REPORT OF THE CHIEF VETERINARY OFFICER FOR THE YEAR 1932.

The veterinary staff of the County of Surrey consists of a chief veterinary officer, and four whole-time assistant veterinary officers.

This staff has now completed four years' work in the county. During the first three years their duties were chiefly confined to work arising under the Milk and Dairies Act, and the Tuberculosis Order, whilst the remaining veterinary duties under the Diseases of Animals Acts were carried out by a panel of practising veterinary surgeons working under the direction of the chief veterinary officer. Throughout the year 1932, however, the whole of the veterinary work was dealt with by the whole-time staff.

During the year under review, there were very few outbreaks of scheduled diseases in the county other than tuberculosis and swine fever. Fourteen cases of suspected anthrax were investigated, of which two only were confirmed. Two cases of parasitic mange were reported, one of which was confirmed. There were no cases of sheep scab or foot-and-mouth disease.

Thirty-eight cases of swine fever were confirmed in the county during the year, but this disease is not dealt with by the council's veterinary staff.

With regard to tuberculosis, 110 suspected cases were reported to the local authority by

stock-owners. Of these, 37 were diagnosed as not coming within the scope of the Order, and the remaining 73 animals, together with 114 cases detected during routine inspection of dairy herds, were slaughtered in accordance with the Order, making a total of 187 cattle. Sixty-two, or 33·15 per cent., of this total were found to be affected with tuberculosis of the udder.

The examination of sputum has proved a valuable method of diagnosing pulmonary tuberculosis in cattle. Forty-seven samples of sputum were examined during the year, and tubercle bacilli were detected in 22 of them, or 46·8 per cent. Five hundred and seventy-two samples of milk were also taken by the veterinary staff for examination as to the presence of tubercle bacilli, and 46, or 11·17 per cent., of these were positive.

At the end of 1932, there were 1,117 registered herds in Surrey, comprising 19,046 cows, of which 16,096 were in milk. Every registered herd was clinically examined by a whole-time veterinary inspector at least once during each quarter of the year.

There are nine herds in the county supplying "Certified" milk, and three herds supplying "Grade A (Tuberculin Tested)" milk.

Surrey continues to be one of the foremost counties in England as regards the supervision and examination of all milk-producing animals within its area. A testimony to the educational value of the routine examination of dairy herds in Surrey is provided by the fact that milk producers generally are taking an increasing interest in the management of their herds, particularly from a disease prevention point of view. Many farmers in Surrey are beginning to realise the advantage of building up a self-contained herd, and the periodical visits of the veterinary staff are well received and appreciated.

E. C. L.

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CITY OF LIVERPOOL VETERINARY DEPARTMENT

ANNUAL REPORT FOR THE YEAR 1932

Once again the annual report of the Chief Veterinary Officer of Liverpool proves to be a mine of thoroughly useful information for all who are interested in municipal veterinary service, and the activities of the department are obviously thriving under the leadership of Captain Noel Pillers.

The report deals with the management and maintenance of the Corporation stud; veterinary attention to animals owned by the several Committees of the Council; examination of dairy cattle, and general supervision of the City's milk supply, and administration of the Diseases of Animals Acts and Orders.

The strength of the stud shows a decrease of 76 horses as compared with last year, the present strength being 279 horses. Despite this most regrettable diminution, the Liverpool stud maintains its wide reputation for quality and type; during the year, of 22 entries at various shows, eight first, eight second, and three third prizes were gained by Corporation horses. As one expects from the quality of the veterinary attention given to the stud, the number of deaths and of ineffective animals again proved very low.

Statistical information is given showing the number of animals attended on behalf of various Committees, and one reads also that the training of boys in stable management prior to emigration was carried on as in previous years.

The examination of dairy cattle and supervision of the City's milk supply occupy a prominent place in the report. Approximately one-fourth of the total milk supply is produced within the City, the remainder originating in the adjoining counties. The estimated dairy cow population of the City is 3,730 cows. During the year 22 cases of tuberculous mastitis were dealt with, and four cases "giving tuberculous milk" were detected. Of these 26 cases, nine were found during routine clinical examination, the remaining 15 being discovered through reports from owners or through positive bulk-samples of milk taken by the Health Department, the total number of samples of "City milk" taken by that Department being 373, of which 15 proved to be tuberculous.

Each dairy cow in the City was examined approximately twice during the year. This, as the Chief Veterinary Officer points out, is by no means satisfactory, but greater frequency of examination was impossible on account of shortage of staff, and it is to be hoped that the Council will see fit to bring the staff up to requisite strength so that the quarterly examinations advised in the report will become a reality.

Pressure of work has also retarded the progress of the microscopical examination of group-samples of milk, an innovation which holds out great promise, and which is worthy of every encouragement. The report states that non-tuberculous mastitis is very prevalent in City cattle, as in country herds, and the observation is made 'While it (non-tuberculous mastitis) is seldom of any danger to the public, its control is very desirable." All will agree as to the desirability of controlling these forms of mastitis, but not all will concur as to their comparative freedom from danger to the consumer.

In Liverpool, general hygiene and sanitary requirements of cowsheds are supervised by an inspector of the Veterinary Department; this is much to be preferred to the dual-control carried out in some towns by members of both veterinary and sanitary departments.

All sampling of milk coming into the City from outside sources is carried out by the Health Department. This could be done to better advan-

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tage by an inspector of the Veterinary Department; by this means a more intensive sampling of milk from certain farms, known to the veterinary officers as of low standard as regards health of cattle, could be carried out, a procedure which has shown good results in other hands.

During the year, 28 visits were made by the veterinary staff to country farms sending in tuberculous milk; 1,106 cows were examined, and 23 cases of tuberculous mastitis were discovered and dealt with. Hospitals and institutions purchasing non-graded milk call in the veterinary staff to inspect the farms from which supplies are drawn and to examine the cows on those farms. During the year 62 farms were visited (49 being found suitable) and 2,445 cows were examined. This system is an excellent one, and might well be copied by other municipal authorities.

Tuberculin tests of 673 animals were carried out, involving 129 visits to farms.

The concluding section of the report deals with work under the Diseases of Animals Acts. Much of the work is of a routine character, but certain portions call for notice. Under the Tuberculosis Order, 1,136 animals were examined, 66 slaughtered and classified as follows:—

Tuberculosis of the udder	22
Giving tuberculous milk	4
Tuberculous emaciation	7
Chronic tuberculous cough	33

Of the above 66 animals, 53 proved, on *post-mortem* examination, to be "advanced" cases, the remaining 13 being "not advanced" within the meaning of the Order.

Two cases of anthrax occurred within the City during the year, one cow being affected in each case.

Under the Glanders of Farcy Order the lungs of all equines (723 in number) slaughtered at knackeries were examined as a routine measure, but no suspicious cases are reported.

The City was again free during the year from both parasitic mange and rabies. Two outbreaks of swine fever, both in pigs from outside sources consigned to the abattoir for slaughter, were confirmed. The Chief Veterinary Officer makes a plea for the revision and consolidation of the existing Swine Fever Orders; in this he has the support of many other municipal and county veterinary officers. Notes on the action taken under the numerous Orders dealing with prevention of animal disease, export, import and transit of animals and their protection, and statistics showing the vast amount of visitation, etc., involved in these duties are given in the report and form interesting and illuminating reading.

Capt. Noel Pillers is to be highly congratulated on the success which has accompanied his succession to the leadership of the Liverpool Veterinary Department, and his report is ample evidence of the wisdom of his Council in securing his services as their Chief. H. B.

N.V.M.A. Divisional Reports

NORTH OF SCOTLAND DIVISION*

OUTING IN THE BANCHORY DISTRICT

The half-yearly meeting of the Division, which took the form of an outing, was held on Saturday, August 12th, 1933, and members and friends spent a very pleasant afternoon with headquarters at Banchory.

Those present at the outing were: Mr. and Mrs. Crabb, New Aberdour, and friends; Mr. and Mrs. Cumming, Culter; Mr. and Mrs. Drennan, Aberdeen; Mr. John Grant, Aberdeen; Mr. Hyland, Banchory, and friends; Mr. and Mrs. Lyon, Banff; Mr. McPherson, Huntly; Mr. McLauchlan, Brechin, and Miss Sutherland; Mr. and Mrs. Niven, Inverurie; Mr. and Mrs. Robson, Laurencekirk; and Mr. and Mrs. Howie, Aberdeen.

There were also present, as guests of the Division, Mr. and Mrs. Nairn, from Blairgowrie, who received a very hearty welcome from the members.

Apologies for absence were received from: Messrs. Wm. Anderson, Keith; James Anderson, Keith; D. Clerk, Stonehaven; D. Coull, Buckie; R. M. Davidson, Banff; A. Macfarlane, Aberchirder; A. Sievwright, Tarland; John Beattie, Longside; J. B. Russell, Elgin; and W. Hepburn, Aberdeen.

The members and their friends met at Banchory, where lunch was served, and immediately after lunch the party motored to Glassel, and there had the privilege of being shown over the famous Rock Garden, which Mr. Wood had very generously allowed them to see. All members expressed themselves as thoroughly delighted with the visit to Glassel, and were very much impressed at the charming way Mr. Wood and Miss Robertson exerted themselves in their effort to show all the beauties and curiosities in their famous garden. Fortunately the weather during the whole visit was delightful—sunshine being tempered with a cooling breeze, so that the older members of the party felt in no way fatigued. It was noticed that many of the members were very busy with their notebooks and pencils, taking down the names of the rarer rock plants. It would seem that rock gardening is a popular form of recreation amongst the veterinary profession. At the conclusion of the visit to Glassel, Mr. Robson proposed a very hearty vote of thanks to Mr. Wood, and expressed the opinion that all the members of the party had thoroughly enjoyed the visit, and he hoped that they might have the same privilege extended to them on some future occasion. Mr. Wood suitably acknowledged, and said that he had enjoyed the visit almost as much as the members themselves had done, and

* Received for publication, September 2nd.

he would certainly welcome them again at any time. His only regret was that he was unable to offer them hospitality, but unfortunately the hall which he used for the purpose was temporarily closed.

The members returned to Banchory, where tea was served, and Mr. Duncan Cumming expressed the feeling of the members when he thanked Mr. Nairn for visiting our Division. Mr. Nairn replied that it had been a pleasure to visit the North of Scotland and he had thoroughly enjoyed his day. It was always a pleasure to him to meet fellow veterinarians and to do all in his power to further the interests of the veterinary profession as a whole.

Business Meeting

The members of the Division had a short business meeting, Mr. Cumming, of Culter, being elected to the chair, in the absence of the Chairman and Vice-chairman.

The President referred sympathetically to the death of Mr. H. F. MacVean, Craigellachie, and the members paid their respect to his memory by standing in silence.

Correspondence from the Secretary of the National Veterinary Medical Association was read and discussed, and it was agreed at the meeting that the subject for the meeting at the end of the year be furnished by members themselves in bringing forward for discussion "Interesting Cases."

Intimation was received from Mr. Moir, Aberdeen, that he wished to resign his membership, but the members hoped that he would reconsider his decision.

George Howie, *Hon. Secretary.*

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MID-WEST AND SOUTH WALES V.M.A.*

WYE VALLEY VISITED FOR THE SUMMER MEETING

The summer meeting of the Mid-West and South Wales Division of the N.V.M.A. was held in the Wye Valley, on Friday, July 20th, when a most enjoyable afternoon and evening was spent by the members and ladies present.

The following members were present:—Messrs. J. R. Barker (President), J. J. Aveston, J. C. S. Powell, J. C. Coleman, C. Digby Watkins, S. V. Golledge, C. R. Golledge, C. J. Pugh, T. J. Margarson, R. Moore, G. H. Thomas, W. D. Rees, H. S. Robinson, J. R. Hewer, F. C. Hobbs, J. R. Baxter, J. W. Hall Masheter, W. R. Watson, J. Howard Jones, J. S. Pike, and C. E. Perry (Hon. Secretary), together with the following visitors: Messrs. W. J. B. Watson, S. J. Cotton, P. Malcair, T. J. Tucker, D. E. Davies, and L. B. A. Grace.

Ladies present were Mesdames Barker, Rees, Margarson, Dinslow, Tucker, Hewer, Hobbs, Baxter, Watson, Perry, Howard Jones, and the Misses Robertson and Watson.

After meeting at Newport, the party proceeded by char-a-banc and private cars to Lord Tredegar's home farm, where the sub-palpebral and double intradermal tuberculin tests were demonstrated by Messrs. Barker, Robinson and Pugh.

Proceeding onward, Monmouth was reached about 4 o'clock, when a meeting was held at the Beaufort Arms Hotel, and a discussion took place on the merits and demerits of the two tuberculin tests.

Obituary.—At the commencement of the meeting, the President intimated that since the last meeting we had lost one very old member and supporter of the Division, namely, Mr. E. P. Evans, of Whitchurch, Cardiff. The members stood in tribute to his memory.

Resignation.—It was reported that Major Storrar had resigned owing to his leaving the district.

New Members.—The following new members were elected: Messrs. Mulcair, Grace, Cotton, Tucker, and Davies.

After the meeting we were joined by the ladies in the dining room, where our hosts, Messrs. Barker, Robinson, Pugh, and Masheter provided us with a Wye salmon tea, which was very much appreciated.

At the conclusion of the repast, a hearty vote of thanks was accorded the hosts for their kind and generous hospitality, on the proposition of Mr. W. D. Rees, seconded by Mr. Aveston, and supported by all present.

The happy party then proceeded down the beautiful valley to Chepstow, stopping at Tintern to view the ruins of the old Abbey, and a most enjoyable ride brought us back to Newport.

C. E. Perry, *Hon. Secretary.*

* Received for publication, September 13th.

Veterinarian's Appointment as Meat Inspector for Ripon

The *Yorkshire Herald* reports that at a meeting of Ripon City Council an amendment that a minute of the Health and Housing Committee recommending the appointment of Mr. A. D. McPhee, M.R.C.V.S., as meat inspector be referred back was defeated.

The minute outlined Mr. McPhee's application, which stated that he had carried out the duties of Inspector on behalf of the late Mr. J. R. Simpson at Ripon for the last three years.

Councillor Hargrave said that he did not believe in giving the post to a man who was not a specialist, and he thought the committee was right in confirming the appointment.

Councillor Miss Wells said the fact that applicant was a veterinary surgeon was an asset to a meat inspector.

The Mayor voted against the amendment, which was lost, and the minutes were confirmed.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

Oct. 9th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Oct. 12th.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Lincoln.

Oct. 19th.—Meeting of the Western Counties Division, N.V.M.A., at Taunton.

Oct. 25th.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool.

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The "Congress Number"

The next issue of the *Veterinary Record* will be devoted to the official report of the proceedings of the highly-successful Congress held by the National Veterinary Medical Association at Llandudno, from September 18th to 22nd, 1933.

With the exception of reports of discussions upon Nos. 3-9 of the papers presented, which will be published in succeeding issues, the Congress Number, which will be greatly enlarged, will deal fully with all the features of the Meeting, and members or subscribers requiring additional copies should make early application to the Editorial Representative, N.V.M.A., 2, Verulam Buildings, Gray's Inn, W.C.1.

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R.C.V.S. OBITUARY

Bowie, Thomas Cunningham, Stranraer, Wigtownshire. Graduated Glasgow, April 13th, 1880; died September 23rd, 1933, aged 74 years.

Chalmers, Daniel Reid, Major R.A.V.C. (T.A.) (retd.), St. Margaret's, St. John's Road, Tunbridge Wells. Graduated Edinburgh, May 18th, 1898; died September 27th, 1933.

Delacherois, Charles Hutcheson, "The Firs," London Road, Charlton Kings, Cheltenham, Glos. Graduated London, May 12th, 1893; died September 28th, 1933, aged 65 years.

Healy, John Francis, Rock Lodge, Midleton, Co. Cork, I.F.S. H. and A.S. Cert. 1881; graduate N. Ed. 1889. Died September 28th, 1933.

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The Late Major Chalmers

All those practitioners who had the good fortune to meet Major D. Chalmers will be shocked and grieved to learn of his death from heart failure on September 27th. A friend writes of him: "A better-hearted or more jovial fellow could hardly be found, and he made a very considerable number of friends in all branches of the Army throughout the years of the war, and for 15 years succeeding that period. Major Chalmers had been in ill-health for the past two years, and his practice has been carried on by his son George."

Our deep sympathy is extended to his widow and two sons.

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The Late Mr. Jack Healy, m.r.c.v.s.

An Appreciation

(Contributed)

News of the death of Jack Healy, of Midleton, will have come as a shock to a host of friends and admirers. Known to every sportsman and lover of a horse in Ireland, and to many outside Ireland, Jack Healy occupied a warm corner in their hearts, for his was a personality combining all the grandest ideals of a good fellow.

After having first obtained the certificate of the Highland and Agricultural Society, in '81, he was admitted M.R.C.V.S. from the New College, Edinburgh, in 1889. He spent some time with the late Mr. Ashe in Cork, and soon started at Midleton, where he enjoyed a very extensive practice.

Born for his job, Jack Healy was an enthusiastic member of the veterinary profession. Ever anxious for its progress, he jealously upheld the best interests of the profession, and, though always a busy man, he seldom missed the opportunity of attending any important function or meeting of the profession in Ireland or in England.

A true sportsman, he loved all forms of sport; no man ever enjoyed more a day's shooting, fishing, racing, or one spent on top of a coach. He was a fine horseman and a keen rider to hounds, and he had the pleasure in his day of being mounted with almost every pack in Ireland and with many of the best in England.

Possessed of an attractive simplicity, he found fun and amusement at every turn; he enjoyed a joke, could tell a good story, and loved a good song. Kind and generous, with the heart of a lion, his hospitality was boundless. Always regarded as an able practitioner, students were ever anxious to see practice with him, and there are to-day many well-known and successful members who will look back with pleasure to the happy time spent with him, and whose success is largely due to his guiding care.

He was one of the chief men employed by the Department of Agriculture in their various schemes, and for many years was Chief Veterinary Officer to the Munster Institute at Cork.

A unique and lovable character, there was only one Jack Healy. He will be missed by clients and friends, and mourned by his beloved and devoted wife. The veterinary profession has lost a worthy member—a noble soul has departed.

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PERSONAL

Births.—Knowles.—On September 19th, 1933, at Stanwell Lodge, Stanwell, Middlesex, to Grace (*née* Gibson), wife of Major R. H. Knowles, R.A.V.C.—a daughter(Anne Lillian).

Perkins.—On October 2nd, to Elizabeth, wife of L. Edward Perkins, M.R.C.V.S., of Durham—a son.

Tillyard.—On August 18th, 1933, to Margaret, the wife of Major G. E. Tillyard, R.A.V.C., 18, Staff Road, Ambala, Punjab—a son.

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Appointments.—Messrs. R. T. H. Massey, M.R.C.V.S., and H. G. Silcock, B.Sc., M.R.C.V.S., have been appointed inspectors, Diseases of Animals Division, Ministry of Agriculture and Fisheries.

The Veterinary Inspector to Macclesfield Corporation, Mr. A. J. Wright, M.R.C.V.S., has also been appointed to a similar position by Congleton.

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Colonial Officers' Leave.—Captain D. H. Dimes, M.R.C.V.S., and Mr. P. G. Short, M.R.C.V.S., are on leave from Tanganyika Territory and Straits Settlements, respectively.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.
All correspondence must bear the name and address of the contributor for publication.
The Editor does not hold himself responsible for the opinions of his correspondents.

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DISEASES OF BOVINE ORIGIN OTHER THAN TUBERCULOSIS

Attitude of the Ministry of Health

To the Editor of the Veterinary Record

Sir,—I note in your issue of September 30th, a reference to Earl Winterton's letter, inspired by Sir Weldon Dalrymple-Champneys' speech at the N.V.M.A. Congress, written to *The Times* of September 26th, 1933. Perhaps it would be relevant to take this matter a little further in order to show the Ministry of Health's attitude, not only to undulant fever, but to other diseases of bovine origin other than tuberculosis. For this purpose, I propose to take the Chief Medical Officer of Health's report for 1932.

"Bovine diseases other than tuberculosis which endanger the health of man are of great importance and must be carefully watched in all milk producing herds, especially in those licensed for the sale of designated milks. In addition to the notifiable diseases a number of pathological conditions which affect cattle, including mastitis, are scheduled on the Milk and Dairies (Consolidation) Act, 1915 and in later legislation (Milk and Dairies Order, 1926). *The sale of milk for human consumption in any form from animals suffering from such conditions is prohibited.* Is the sentence italicised above carried out in inspections either by whole-time or part-time inspectors?

Sir George Newman then considers contagious abortion.

"Contagious abortion is of considerably *greater importance* to cow keepers than *mastitis*, as it takes a heavy annual toll from the herd owners' pocket, and seriously disorganises his milk supply. Many dairy herds in the country are affected by the disease and most milk producers have some knowledge of the different methods of reducing its ravages. Unfortunately, however, comparatively few dairymen are aware of the danger to man of milk infected with *Br. abortus*. Attention was drawn in my last report to the fact that a large proportion of the milk supplies in this country contain this organism. The commonest method of preventing or reducing losses on the farm through bovine abortion is to inoculate the cattle with a living attenuated culture of the organism. Such inoculations certainly do reduce calf losses, and lessen disruption of the milk supply, *but do not in any way protect the consumer from infective milk. On the contrary, such inoculation may be expected to increase the risk to consumers of the affected milk.*

"*The alternative method of carrying out the blood agglutination test on the cows and the segregation of positive cases, should provide a solution satisfactory both for the milk producer and for the consumer and extension of this test is desirable in licensed herds.*"

I agree that the inoculation of living bacilli may be expected to increase the risk to consumers. In fact, I think it does, for the disease can never be eradicated by adding fuel to fire. I do not agree that segregation of reactors is the best alternative. It certainly would produce clean herds, but at what expense? Abortion+tuberculosis=extermination of the herds.

Research workers are looking for a "dead vaccine." Is there not one in existence at the present time? Personally, I have used one for the last 25 years or so, with what I consider good results—at least, it stops the abortion, and that without infecting clean cattle. I believe J. B. Buxton initiated this method. I think it acts in this way: All the cows and heifers are vaccinated whether in calf or not, and allowed to mix freely with the aborting ones. The vaccination gives a passing immunity, and I believe it to be to some extent curative. In-contacts may, and probably do, contract the disease, but only to the extent that a strong immunity is set up. This argument may be unorthodox, but the "end" result is good, as abortion stops and herds remain clean.

To continue, Sir George Newman goes on to say: "The increased interest in undulant fever in man which I noted in my last report, has shown itself in even greater degree during the year under review. Most of the 115 well authenticated cases coming to the notice of the Department occurred in 1929-32, but it is quite certain that many cases are not diagnosed, and that many diagnosed cases are not reported. It may be noted that in the United States of America, where undulant fever is compulsorily notifiable in most States, a rapid increase has occurred in the number of reported cases from one in 1922, to 1,545 in 1931.

"In the world in general the same apparent increase has occurred. Sir Weldon Dalrymple-Champneys' in 1929, gave a list of 50 countries, and to that eleven others must now be added. In the English and Welsh cases, 115 in the present series, there was an irregular fever together with an agglutination titre of at least 1 in 100 in 52 per cent. of the cases, and averaging 1 in 1,500 over the whole series. In nine cases the diagnosis was confirmed by cultivation of the causal organism—seven times from the blood and twice from the urine.

"With regard to distribution, the information available indicates that the disease occurs in all parts of the country. More males than females are affected, and this is difficult to explain. One would expect that women would be the greatest sufferers as they usually drink more milk than men. Direct contact with animals is regarded as a more important source of infection than raw milk. It seems possible that men, for the very reason that they consume less milk, are apt to lose that immunity to *Br. abortus* which women and children maintain by the regular consumption of infected milk. Maintenance of immunity by doses of the causal organism, too small to produce clinical symptoms, may also account for the apparently low incidence of the disease in human beings in spite of the wide prevalence of contagious abortion in cattle."

The foregoing does not seem to help Sir George very much in his campaign for universal pasteurisation. "Some indication as to the etiology can be obtained from a study of the patients' *occupation* and their history of *drinking raw milk*, or *coming in contact* with infected

animals. A good many professions and occupations are represented among the 97 patients for whom this information is available. Farmers and farm workers and other people living on farms comprise 13 persons, or 8 per cent. of the whole series. This low figure is in *marked contrast* to those given for other agricultural countries. In New Zealand, 47 per cent. of the cases occurred among dairy farm workers, and Maclean concludes that, considering the probable exposure to more or less infected milk of a large part of the general population, it is evident that *milk infection* plays but a small part in the epidemiology of the disease."

Sir George Newman then goes on to beg the question in favour of his pet scheme of pasteurisation. He says: "The evidence of infection from bovine sources in the 83 cases of the series for which this information is available is somewhat variable, if not conflicting. In some cases, the source of infection is proved up to the hilt, whilst in others there is only the history of drinking raw milk, or of contact with bovines which may or may not have been infected. It is, however, significant that 78 out of 83 persons were in the habit of drinking raw milk, whilst only eight had contact with bovines and three of these had drunk raw milk as well."

Then he quotes the taking of blood samples from veterinary surgeons at the Congress last year, where blood was collected from 98 veterinarians, 63 of whom had been in contact with aborting animals, whilst 35 had had no such contact.

In the first group there were 15 whose blood serum agglutinated Brucellæ, whilst in the second group there was only *one*, and he was a laboratory worker who handled cultures of the Brucella.

This seems to be rather against his contention that raw milk is the medium of infection.

He concludes by remarking that undulant fever in this country must be regarded as a disease which deserves the attention of both clinicians and epidemiologists.

Sir George Newman tries to make out a case for the wholesale pasteurisation of milk all through his report, but he candidly admits that the producer-retailer is rather a "snag," as he represents 30-40 per cent. of the total milk supply whose milk cannot be heat treated.

He gets closer to the solution, however, by saying "The proper administration of the law, and regulations under it, in every sanitary area" is part of the scheme for a clean and safe milk supply. With that we must all agree. The laws and regulations are there all right, if they were universally carried out by sanitary officials. The whole report is most interesting and informative, even if the veterinary profession is taken to task for its shortcomings. I have only taken a very small part of the report, but it is very interesting to see the view-point of the medical profession in regard to animal diseases.

The Chief Medical Officer of the Ministry of Health recognises one important fact, and that is where, in reference to preventive medicine, he says "*Here, as elsewhere, the general practitioner forms the first line of defence.*" That important fact seems to be in danger of being forgotten in the veterinary profession. *There are* 16,000 *general practitioners in the British Isles who are doing State service,* i.e., *panel practice. Every general practitioner can, if he cares to do so, join that service.*

Another item of interest is that only 395 M.O.'s H. out of 1,167 were *whole*-time men There were 50 vacancies in 1932, and 24 were filled by *part*-time men, and only six by *whole*-time men.

I recommend this report to all veterinary practitioners.

I have the honour to be, Sir,
Your obedient Servant,
J. W. Hall Masheter.

Ruddle House,
Newnham-on-Severn.

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THE SLAUGHTER OF SHEEP

To the Editor of the Veterinary Record.

Sir,—May a reader of the *Veterinary Record* be permitted to express profound disagreement with the opinion given by the Principal of the Veterinary College in the Dublin District Court on September 11th, that there is no cruelty involved in allowing sheep to be slaughtered in sight of one another.

As one who has seen hundreds of sheep and lambs slaughtered under all conditions, and by all methods of slaughter, I am convinced that sheep, as well as other food animals, are terrorised by the sight and odour of blood and offal. I have seen sheep and lambs huddle themselves together in the farthest corner of the old-fashioned slaughter-houses in many parts of the British Isles, showing unmistakable signs of fear and distress as they saw one victim after another being dragged away, in turn, to be thrown on the "crutch" where its throat is "stuck," usually while it is fully conscious, and where the creature lies until the blood ceases to flow. If there are many sheep to be slaughtered there may be three, four, or more "crutches" full all the time.

Only those with practical knowledge of slaughter-house methods can visualise a scene such as this, and the fact that sheep and lambs are rarely stunned before being bled, either by mechanical means or otherwise, adds to the horror of it, except in Scotland and Northern Ireland, where mechanical slaughter of all food animals (except swine) has been in force, by Act of Parliament, since 1928 and 1932 respectively.

One cannot, therefore, imagine how any person, expert or otherwise, who has experience of slaughter-house conditions, can hold the opinion that there is no cruelty in slaughtering animals in sight of each other. Even if it be granted that sheep are the least intelligent of domestic animals, it was admitted in court that "on that account they would react to such a scene as described more by instinct than by any process of memory or reasoning." Surely if they react at all, whether by mental reasoning or otherwise, suffering ensues.

Yours, etc.,
F. M. Holmes.
Joint Hon. Sec., Headquarters.

Ulster Society for the Prevention of Cruelty to Animals,
18, Ocean Buildings, Belfast.
September 15th, 1933.

The Editor acknowledges, with thanks, the receipt of the following:—

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